treated component containing the treating gas into a quenching chamber; feeding a quenching gas into the quenching chamber to contact the treated component and mix with the treating gas; feeding the quenching gas and treating gas of the previous step into a gas recovery chamber where the treating gas and quenching gas are separated to provide a purified quenching gas; feeding the purified quenching gas of the previous step back into the quenching chamber; and removing the cooled treated component from the gas quenching chamber.

REMARKS

Claims 1-7 are pending in this application. Applicants hereby affirm the election to prosecute the election of Group I, claims 1-7, without traverse, and reserve the right to prosecute the subject matter of Group II, claims 8-16, in a separate continuation application.

Claims 1-7 were rejected under U.S.C. §103 in view of U.S. Patent No. 5,938,866 to Andersson et al. ("Andersson"). Claims 2, 3, and 7 were rejected under 35 U.S.C. §112, second paragraph. The drawings, the information disclosure statement and the abstract were objected to.

At the onset, in response to the objection to the information disclosure statement, applicants provide the following citation information regarding one of the references. The correct citation is as follows: Holm, T. and Segerberg, S., "Helium Recovery and Cleaning for High Pressure Gas Quenching Connected to an Atmosphere Furnace", The Third International Conference on Quenching and Distortion Control, March 1999.

Also, applicants have amended the abstract to provide its contents with greater detail by submitting a new abstract.

With reference to the drawings, applicants have noted the objections in this office action, and submit that they will provide new formal drawings addressing the deficiencies highlighted by the office

action at a later date. Should the Examiner require corrected drawings for the purpose of examining this application, applicants will provide new drawings at the Examiner's request.

Applicants have amended claims 2, 3 and 7 to overcome the 35 U.S.C. §112, second paragraph rejection. Applicants thank the Examiner for suggesting the proper Markush format. The amended claims now have the proper Markush format.

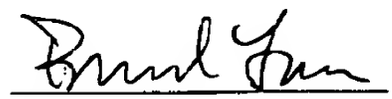
Turning to the claim rejection, applicants respectfully request that the Examiner reconsider and withdraw the 35 U.S.C. §103 rejection to claims 1-7 over Andersson on the basis of the following reasons.

Andersson discloses an apparatus for the treatment of component by means of a gas mixture, comprising mainly a first light gas and a minor amount of a second gas being heavier than the first gas, has a treatment chamber in which the treatment occurs and a concentration, and purification devices in which the gas mixture is concentrated and purified to increase the concentration of the first gas. (See, U.S. Patent No. 5,938,866, in its abstract and claims). This is done in a pressurized atmosphere (i.e., under vacuum; see, i.e., col. 3, lines 27-40) [T]he nitrogen present in the gas mixture being absorbed by the zeolite in the purification column 29, whereas the lighter helium passes through the purification column 29 and the zeolite, and is transported further via the valve 33 and the conduit 35 to the pressure tank 36 (See, '866 patent at col. 5, line 64-col. 6, line 1). Generally, Andersson is believed to disclose a process that uses purifying columns filled with molecular sieve to remove nitrogen only. The process uses one or more reduced pressure (i.e., vacuum) steps to separate the endothermic gas and nitrogen from the heat quenching parts. Purification is facilitated by significantly reducing the endothermic gas contaminants to a single component such as nitrogen at a reduced concentration, the purification of helium is facilitated.

Andersson does not teach or suggest the present claims for heat treating a component in an atmospheric heat treating furnace, and in fact, Andersson teaches away from the present claims, in that the purification of helium will be significantly more difficult and provide significantly poorer economic value if modified to remove endothermic gas without the vacuum step(s), as that provided in the present claims. The present claims are directed to heat treatment in an atmospheric heat treating furnace. The incorporation of pressurized heat treating under a vacuum teaches away from facilitating helium purification. Accordingly, Andersson does not teach or suggest the claimed invention. Reconsideration and withdrawal of the claim rejection under 35 U.S.C. §103 are respectfully requested.

In view of the amendment and remarks herewith, claims 1-7 are believed to be in condition for allowance. Favorable consideration and prompt issuance of a Notice of Allowance are respectfully requested.

Respectfully submitted,



Bernard Lau
Attorney for Applicants
Reg. No. 38,218

Praxair, Inc.
39 Old Ridgebury Road
Danbury, CT 06810-5113
Tel: (203) 837-2292
Facsimile: (203) 837-2545
Date: April 3, 2002

Marked version

IN THE CLAIMS

2. The process of claim 1 wherein the atmospheric furnace is a carburizing atmospheric furnace and the treating gas is selected from the group consisting of ~~comprising~~ methane, carbon monoxide, hydrogen, nitrogen, pentane and butane.

3. The process of claim 1 wherein the quenching gas is at least one gas selected from the group consisting of ~~comprising~~ helium as the major component and one gas selected from the group comprising nitrogen, hydrogen, argon and carbon dioxide.

7. The process of claim 2 wherein the quenching gas is at least one gas selected from the group consisting of ~~comprising~~ helium, nitrogen, argon and carbon dioxide.

IN THE SPECIFICATION:

Starting at Page 22, line 6:

~~Apparatus and process for recycling a quenching gas, such as helium, to be used with a treating gas, such as a carburizing gas, for the treating of components in an atmospheric furnace.~~ This invention is directed to a process for heat treating components in an atmospheric heat treating furnace comprising the steps of treating a component in an atmospheric furnace with a treating gas; feeding the heat treated component containing the treating gas into a quenching chamber; feeding a quenching gas into the quenching chamber to contact the treated component and mix with the treating gas; feeding the quenching gas and treating gas of the previous step into a gas recovery chamber where the treating gas and quenching gas are separated to provide a purified quenching gas; feeding the purified quenching gas of the previous step back into the quenching chamber; and removing the cooled treated component from the gas quenching chamber.